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L22--ANSWER 1 OF 1 HCAPLUS /COPYRIGHT 2002 ACS

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TITLE: Polyamide nucleic acid-DNA chimera lacking the phosphate backbone are novel primers for polymerase reaction catalyzed by DNA polymerases

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AB A peptide nucleic acid (PNA) oligomer, an analog of DNA, was examd. for its ability to function as a primer or a template to support DNA synthesis catalyzed by DNA polymerases. The analog, (PNA)19-TpG-OH, comprised of 19 bases in the form of PNA followed by a dinucleotide (TpG-OH) with a single phosphate and a free 3'OH terminus, was recognized as a bona fide primer by 2 reverse transcriptases and also by the Klenow fragment of E. coli DNA polymerase I. The 21-mer PNA chimera is extended on both RNA and DNA templates by all three polymerases. The specificity of binding of the PNA chimeric primer/DNA template at the template-primer binding site of the enzyme was shown by its photo-crosslinking ability to the enzyme which could be effectively competed out by another TP but not by template or primer alone. Furthermore, the chimeric TP-enzyme covalent complex was found to be catalytically active as judged by its ability to incorporate one nucleotide onto the 3'OH terminus of the immobilized primer. PNA sequences were also recognized as template when annealed with a DNA primer. These observations are in variance with the conventional suggestion that the phosphate backbone in the duplex region is essential for recognition and binding by DNA polymerases. The efficient extension of (PNA)19-TpG-OH suggests that the diam. of the duplex region of template primer rather than the phosphate backbone may be sufficient for recognition by DNA polymerases.

IT 127712-01-0 204935-48-8 204935-49-9

RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)

(DNA primer; polyamide nucleic acid-DNA chimera lacking phosphate backbone are novel primers for DNA polymerases)

RN 127712-01-0 HCAPLUS

CN Guanosine, 2'-deoxyadenylyl-(5'.fwdarw.3')-2'-deoxycytidylyl-(5'.fwdarw.3')-2'-deoxycytidylyl-(5'.fwdarw.3')-2'-deoxyguanylyl-(5'.fwdarw.3')-2'-deoxycytidylyl-(5'.fwdarw.3')-2'-deoxyguanylyl-(5'.fwdarw.3')-2'-deoxycytidylyl-(5'.fwdarw.3')-2'-deoxyguanylyl-(5'.fwdarw.3')-2'-deoxycytidylyl-(5'.fwdarw.3')-thymidylyl-(5'.fwdarw.3')-thymidylyl-(5'.fwdarw.3')-2'-deoxyguanylyl-(5'.fwdarw.3')-thymidylyl-(5'.fwdarw.3')-2'-deoxycytidylyl-(5'.fwdarw.3')-2'-deoxycytidylyl-(5'.fwdarw.3')-2'-deoxycytidylyl-(5'.fwdarw.3')-thymidylyl-(5'.fwdarw.3')-2'-deoxy- (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 204935-48-8 HCAPLUS

CN DNA, d(G-T-C-C-C-T-G-T-T-C-G-G-G-C-G-C-C-A-C-T-G-C) (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 204935-49-9 HCAPLUS

CN DNA, d(C-A-G-T-G-G-C-G-C-C-C-G-A-A-C) (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT 204935-51-3

RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)

(DNA template; polyamide nucleic acid-DNA chimera lacking phosphate backbone are novel primers for DNA polymerases)

RN 204935-51-3 HCAPLUS

CN DNA, d(C-C-T-T-T-T-A-G-T-C-A-G-T-G-T-G-G-A-A-A-A-T-C-T-C-T-A-G-C-A-G-T-G-G-C-G-C-C-C-G-A-A-C-A-G-G-G-A-C) (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT 204935-50-2

RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)

(RNA template; polyamide nucleic acid-DNA chimera lacking phosphate backbone are novel primers for DNA polymerases)

RN 204935-50-2 HCAPLUS

CN RNA, (A-A-U-C-U-C-U-A-G-C-A-G-U-G-G-C-G-C-C-C-G-A-A-C-A-G-G-G-A-C) (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT 9012-90-2, DNA polymerase 9068-38-6, Reverse transcriptase

RL: BAC (Biological activity or effector, except adverse); BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)

(polyamide nucleic acid-DNA chimera lacking phosphate backbone are novel primers for DNA polymerases)

RN 9012-90-2 HCAPLUS

CN Nucleotidyltransferase, deoxyribonucleate (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 9068-38-6 HCAPLUS

CN Nucleotidyltransferase, deoxyribonucleate, RNA-dependent (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT 204997-30-8 204997-31-9

RL: BPR (Biological process); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); PROC (Process)

(polyamide nucleic acid-DNA chimera lacking phosphate backbone are novel primers for DNA polymerases)

RN 204997-30-8 HCAPLUS

CN Peptide nucleic acid, (acetyl-G-T-C-C-C-T-G-T-T-C-G-G-G-C-G-C-C-A-C-(5'-amino-5'-deoxy)dT-dG) (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 204997-31-9 HCAPLUS

CN Peptide nucleic acid, (acetyl-G-T-C-C-C-T-G-T-T-C-G-G-G-C-G-C-C-A-C-T-G)-Lys-OH (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***